ESPRIT Version 1.0

ESPRIT 1.0 Acceptance Test Plan

Title of test to be conducted:	Phase 1 System Acceptance Test (SAT)
Identification of system being tested:	Exercise Scenario Planning and Real-time Integrated Test (ESPRIT) System Version 1.0
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ABSTRACT

This Acceptance Test Plan (ATP) is designed to demonstrate that the Exercise Scenario Planning and Real-time Integrated Test (ESPRIT) System meets Initial Operating Capabilities (IOC) as a scenario planning, rehearsal, event monitoring and playback tool for the Pacific Missile Range Facility (PMRF). Test planning information and procedures are provided to perform Tactical Ballistic Missile (TBM) event planning and rehearsal functions in a stand-alone mode. Recorded data from the CTV-1A event (or TTV-1 data as a back up) shall be used to stimulate the ESPRIT event monitoring and playback capabilities. An additional scenario shall be used to demonstrate system capacity and performance requirements.

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1 Introduction

1.1 Overview

Solipsys Corporation is developing ESPRIT as a scenario planning and rehearsal tool to support U.S. Navy PMRF TBM test events at Barking Sands, HI. This tool has been developed in several software builds of increasing capability. Earlier this year, a preliminary version was used to support mission planning and rehearsal of the SLUGGER test event; however it ran in in background during the actual test while the range continued to operate its legacy systems. Following SLUGGER, Solipsys was able to demonstrate ESPRIT's playback capability. This test plan consists of four phases. The initial phase demonstrates ESPRIT's capability to automate the planning of a TBM scenario. The second phase demonstrates ESPRIT's ability to perform a mission rehearsal. The third phase relies on data recorded from the CTV-1A TBM event (or data recorded at the TTV-1 event as back up) to stimulate the event monitoring and playback functions. The fourth phase shall use a recorded scenario to stress the system and demonstrate its abilty to meet or exceed system performance.

1.2 Document Organization

The ESPRIT ATP is organized into 5 sections as follows:

1. Introduction
2. Applicable Documents list
3. ESPRIT 1.0 Acceptance Test Plan
4. ESPRIT 1.0 Acceptance Test Procedures
   - ?? Phase I Test Procedures – Scenario Planning
   - ?? Phase II Test Procedures – Scenario Rehearsal and Playback
   - ?? Phase III Test Procedures – Event Monitoring
   - ?? Phase IV Test Procedures – System Performance
5. An appendix containing the ESPRIT Requirements Traceability Matrix (RTM) for tracing ESPRIT requirements from the Functional Capabilities Document (FCD) to specific test procedure steps.

2 Applicable Documents

The following documents were used in the preparation of this test plan:

?? Solipsys provided Transition Plan for the Pacific Missile Range Facility (PMRF) Scenario Planner Upgrade, Solipsys, 19 July 1999

?? NSWC-CD Contract N00164-98-D-0048/004 Leads ESPRIT D.O. SOW

?? ESPRIT 1.0 Functional Capabilities, Solipsys Corporation, 30 July 1999

?? ESPRIT 1.0 Requirements Traceability Matrix, Solipsys Corporation, 5 August 1999

?? ESPRIT 1.0 Quality Assurance Test Procedures, Solipsys Corporation, 12 August 1999

3 ESPRIT System Acceptance Test Plan

3.1 Test Objectives

The following, high-level test objectives shall be demonstrated through successful implementation of this test plan:

?? Ability to enter a test plan that accounts for all event players including vehicles, sensors, and range related display objects such as areas of operation, hazard zones, debris zones, sensor coverages, etc. through manually developed overlays, “hardcoded” geographically fixed displays, and range provided data sets entered via file read-in

?? Ability to model and display event vehicular trajectories and sensor capabilities to a fidelity sufficient to plan, rehearse, and conduct a TBM test event

?? Ability to monitor how the actual event conforms to the planned event in real time

?? Ability to process live sensor data and display all event vehicles with the fidelity to conduct real-time operations

?? Ability to provide quicklook replay and analysis of the actual event in real time and at increased speeds

?? Ability to meet system capacity and performance requirements by executing a recorded scenario via the playback function with a minimum of 256 entities (i.e. combination of vehicles and sensors) and by running continuously for 24 hours or more

3.2 Milestones

Table 2-1 identifies significant ESPRIT 1.0 ATP-related milestones:

Table 2-1. ESPRIT 1.0 ATP Milestones

Draft ESPRIT 1.0 ATP Completed	9/10
PMRF Review of ATP Completed	9/16
CTV-1A Event	9/23
Approved ESPRIT 1.0 ATP	9/26
Conduct ESPRIT 1.0 ATP	9/27-28
End of Contract	9/30

3.3 Participation

The ESPRIT 1.0 ATP will be conducted by Solipsys employees before an audience of government representatives, who will observe, assess and record system performance against the approved test procedures provided herin. Table 2-2 indicates the personnel required to successfully perform the ATP.

Table 2-2. ESPRIT ATP Roles and Responsibilities

Role	Organization	Responsibilities
Test Conductor	PMRF	Responsible for overall conduct of test, verifying valid test conditions, overseeing test execution and assessing system performance
Test Coordinator	Solipsys	Responsible for ensuring correct test bed configuration and directing detailed test activities; keeps official test scores
Operator	Solipsys	Responsible for manning display console and executing test Procedures
Sys Admin	Solipsys	Provide software and admin support for loading and configuring system.
TTV1 Operator	PMRF	Provide TTV1 data; coordinate running data from iNet to stimulate test
Boss3 Operator	PMRF	Provide Boss3 data off iNet; coordinate running scenarios

3.4 Location

The ESPRIT 1.0 ATP will be conducted at the PMRF, Kauai, HI using the Automated Precision IFF Surveilance (APIS) room and Range Operations and Control System (ROCS) facilities located in Building 105

3.5 Test-site Configuration and Security

3.5.1 Hardware Configuration

The following hardware components shall be utilized:

- ?? The *Katmai* workstation located in the APIS room shall host the system server
- ?? One ESPRIT TDF workstation located in ROCS A shall host the ESPRIT TDF for system data entry and display
- ?? In the event that the ROCS A facility is unavailable, the TDF Display client shall be connected to the Utility LAN in the APIS room with the server as a back-up configuration
- ?? Client-server connectivity shall be via the existing Utility LAN
- ?? The iNetd LAN shall be used to provide recorded CTV-1A or TTV-1 data to stimulate the system.
- ?? An NTDADS client shall reside off the iNetd LAN and shall be on-line and operational to verify TAOS data in Phase 1 testing.

Figure 2-1 illustrates the test site configuration

3.5.2 Security

Building 105 is a restricted building and the APIS room, due to the classified PMRF iNet, is secure. Due to previous ESPRIT installations, all security requirements are in place. All tests, with the exception of playback scenarios from CTV-1A shall be conducted in an Unclassified mode with regard to data processing and handling. All government procedures related to safeguard and handling of the CTV-1A data shall be followed.

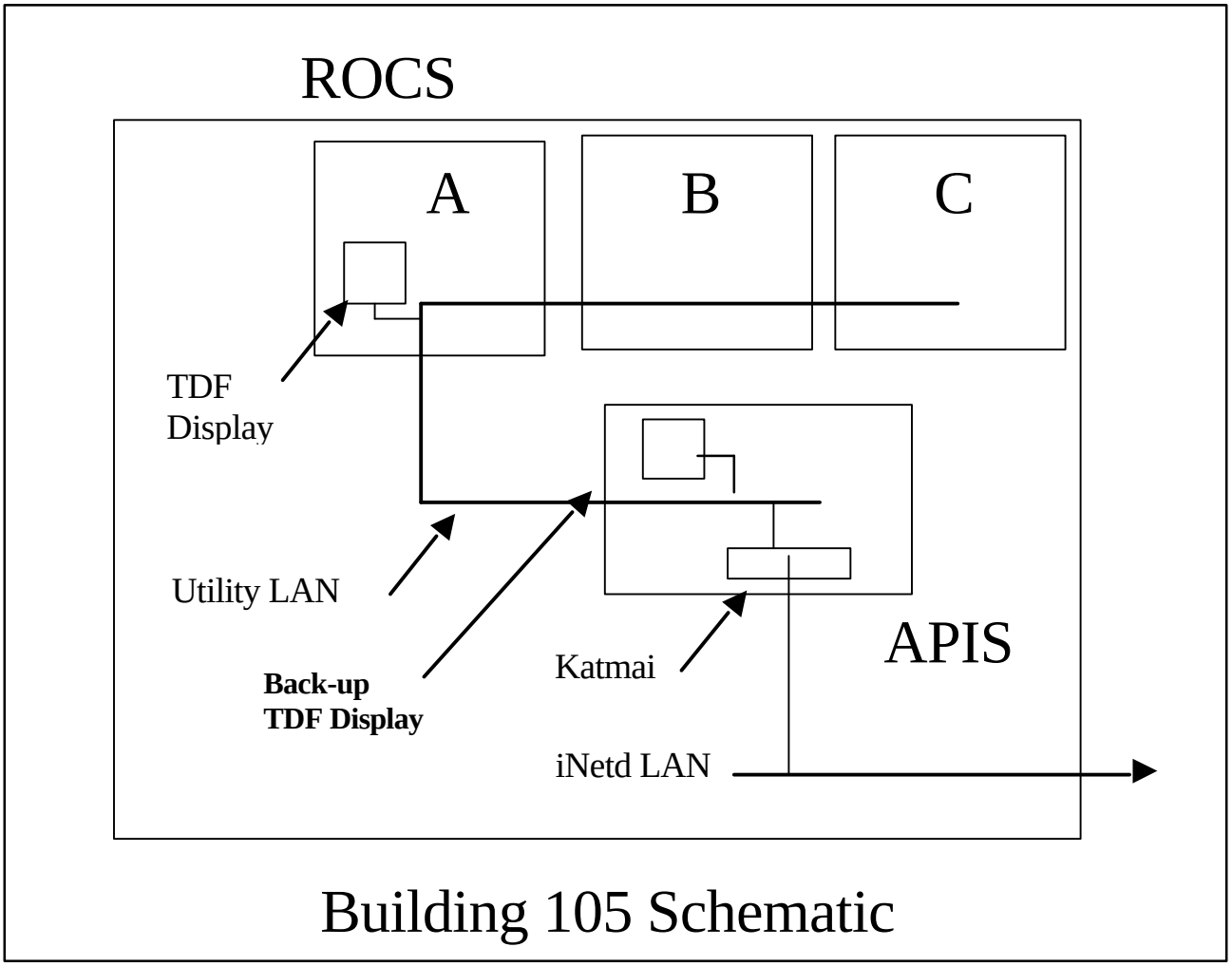

Figure 2-1. ESPRIT ATP Site Configuration

3.6 Master Test List

The following capabilities shall be demonstrated:

1. **Phase I Tests - Scenario Planning**
   a. Vehicle Model Entry Test
   b. Sensor Model Entry Test
   c. Sensor Entity Creation Test
   d. Data Set Creation Test
   e. Data Set Conversion Test
   f. Overlay Generation Test

g. Create Scenario Test

h. Final Scenario Preparation

2. Phase II Tests - Scenario Rehearsal

a. Scenario Playback in local mode and demonstration of

?? Track Lists

?? Scenario Identification Table

?? Scenario Playback Tool

?? Multigraph

?? Alert Display

?? Scenario Playback Test

3. Phase III Tests - Event Monitoring/Playback (CTV-1A or SLUGGER DX)

a. Live Event Simulation and demonstration of

?? Status Menu

?? Visualization Aides

4. System Performance and Endurance Test (scenario driven)

a. System Entity Capacity/Performance

b. System Endurance

3.7 System Acceptance

3.7.1 Acceptance Criteria

The overall objective is to deliver a robust scenario planning system to PMRF as outlined in the ESPRIT 1.0 Functional Capabilities Document (FCD). This document provided the baseline set of requirements that drove the test plan and procedures described herein. Appendix A, the ESPRIT Requirements Traceability Matrix (RTM) shows the test coverage by linking identified FCD requirements to test procedures. The proposed procedure for attaining system acceptance is two-staged:

Stage 1 requires that Solipsys:

?? Gain feedback and approval from PMRF as to the acceptability of the planned test approach

?? Gain feedback and approval of the tests themselves and assurance that the test coverage/completeness demonstrates that the system meets the requirements for CTV-1A and IOC

Stage 2 requires that:

?? That the ATP be executed with minimal problems

3.7.2 Validation of Test Results

The nature of the system allows verification of results based on visusal observation. Any errors shall be noted by the Test Conductor and recorded by the Test Coordinator for consideration in the overall evaluation of the software

3.7.3 Problem Resolution

Solipsys shall fix any software problems encountered during ATP testing that prohibits the system from operating as intended. Following test execution, the Test Conductor shall assess the number and severity of problems encountered. Based on this information a plan shall be developed that will identify must fix problems, any additional changes within the scope of the current functionality, and a time frame for completing the work.

3.7.4 System Acceptance

Following execution of the ATP, the Test Conductor shall review the test results and opt to accept the system for IOC or, presuming only minimal problems are uncovered, conditionally acccept the program based on problem resolution by Solipsys in the time frame alloted. Following completion of any corrective software development, Solipsys shall demonstrate the fixes to PMRF.

3.8 Initial Set-up Conditions

The following initial conditions are required to perform the ATP:

?? ESPRIT shall be loaded and in the configuration described in paragraph 4.5.1, Test Site Configuration

?? The ESPRIT server shall have the *solid* and *scenarioPlanning* programs

?? The following Unix commands shall be entered from the ESPRIT server root directory:

  ?? *setenv ESPRIT_TAOS_EXE = (location of TAOS executable on server)*

  ?? *setenv ESPRIT_TAOS_ROOT = (location of TAOS root directroy on server)*

  ?? *setenv ESPRIT_TBM_MODELS = (location of TBM Models directory on server)*

  ?? *setenv ESPRIT_TBM_TEXT_MODELS = (location of TBM Text Models on server)*

?? The ESPRIT TDF program shall be installed on the display system as described in paragraph 4.5.1, Test Site Configuration

?? The ESPRIT server shall have *iNetd* communications established

?? Communications shall be established between TDF and the ESPRIT server

?? Communications shall have been established with the NTADS system

?? Boss3 data shall be available

?? The planned scenario for CTV-1A shall have been entered into the system

?? The recorded data from CTV-1A shall be loaded in the appropriate directory on the server

?? The planned scenario for TTV-1 shall have been entered into the system

?? The recorded data from the TTV-1 event shall be loaded in the appropriate directory on the server to be used as back-up if for some reason CTV-1A data is not available

?? The ESPRIT "Max Tracks" Scenario shall be loaded in the appropriate directory

?? All CTV-1A and TTV-1 TAOS files shall be be loaded in the appropriate directory on the server

?? At the ESPRIT TDF Display *System* Panel the ESPRIT *Preferences Misc* window shows that the *Enable Live Data* box is checked indicating "enabled."

4 Test Procedures

4.1 Phase 1 Test - Scenario Planning

This test is designed to demonstrate the "building blocks" by which scenario planning basics are put into place. The operator is required to create Vehicle and Sensor Models, Sensor Entities, Overlays and other basic components that must be accomplished to support the actual creation of a TBM event plan. Once Phase I is completed, the operator will have generated a simple TBM event plan.

4.1.1 Vehicle Model Entry Test

4.1.1.1 Objective

The purpose of this test is to verify that a vehicle model can be created and correctly configured and that all related menus and buttons function correctly.

4.1.1.2 Procedure

Vehicle Model Entry Test

Step	Procedure	Expected Result	P/F
1	OPEN EXISTING VEHICLE MODEL Open the *Vehicles…*Panel from the *Models* menu.	*Vehicle Model Chooser* window appears.	
2	Click on the C*ertified* tab to display a list of vehicles. Select one and *Open* it.	*Vehicle Model Editor* window opens. Model name will be the name of the selected model.	
3	SAVE CERTIFIED VEHICLE MODEL LEGALITY CHECK From the *File* menu, attempt to *Save* the Model after modifying.	The current data will be saved as a Working copy of the Certified model. No changes will be made to the Certified model.	
4	SAVE AS DEFAULT VEHICLE MODEL Edit the value of a *Cross Section* attribute.	Entry accepted.	
5	Select the *Save as Default Model* option.	Action accepted. As demonstrated below, when opening a future model of the same type (Surface, ABT (manned), and ABT (unmanned)) and selecting the *Load Default Model* option, the values will be placed in the appropriate fields.	
6	Close *Vehicle Model Editor* window.	Window will close.	

Step	Procedure	Expected Result	P/F
7	Open the *Vehicle Model Chooser* window.	Action accepted.	
8	CREATE NEW VEHICLE MODEL Create a new working model by typing "**ATPVeh1**" into the name field and then pressing the *New* button.	*Vehicle Model Editor* window appears. Model name will contain the name as entered.	
9	EDIT VEHICLE MODEL Edit *Performance* attributes for the new model and the PMRF Vehicle Type.	Velocity, climb rate, dive rate, turn rate, fuel rate of consumption all have Maximum, Minimum, and Nominal performance characteristics. Vehicle Type changes based on menu selection	
10	Change the values of the speed and either the curve radius, bank angle, or maneuver fields.	This should cause the values in the radius, bank angle, and maneuver fields to alter appropriately.	
11	VERIFY LEGALITIES Verify system honors data legalities by entering in data that violate Min, Max, and Nominal field value rules	System accepts illegal data entry for now.	
12	Save the model with the *Save* command.	Errors should occur of the form: x field fails the validation condition: minimum value <= nominal Value <= maximum value	
13	VERIFY UNITS DATA CONVERSION Verify by changing the units of measurement for various data fields by *Right Clicking* on the unit.	When a unit type is changed in one data set (Min, Nominal, or Max) all related data fields are converted correctly in the new unit type format	
14	SAVE MODEL Input valid data and Save the model from the *File* menu. Close window.	Model will be saved and seen under the Working tab of the *Vehicle Model Chooser*.	
15	As before, open the *Vehicle Model Chooser* window.	*Vehicle Model Chooser* window appears	

Step	Procedure	Expected Result	P/F
16	Select the **ATPVeh1** model and use the *Open* button to examine its attributes.	All previously saved data should be retained.	
17	VERIFY DATA DISCARDED WITH NO SAVE ACTION Again edit the attributes but exit without saving.	Action accepted.	
18	Reopen **ATPVeh1** and verify that no data since last save is present.	Any changes made to the vehicle before the last save will be present.	
19	DELETE WORKING VEHICLE MODEL Close the window and reopen the *Vehicle Model Chooser*.	Action accepted.	
20	Select **ATPVeh1** from the *Working* panel and delete it.	Model should disappear from the *Working* dialog box and the input field as well.	
21	VERIFY CERTIFIED MODELS PROTECTED Select a Model from the *Certified* panel and "delete" it.	Model should not be deleted and the delete button should remain grayed out and not selectable.	
22	COPY VEHICLE MODEL Open an existing model. Change the *Model Name* to **ATPVeh2** and *Save* from the *File* menu.	Verify that the new model is in the Working Models list with the correct (same data) as the other model, which also still exists.	

4.1.2 Sensor Model Entry Test

4.1.2.1 Objective

The purpose of this test is to verify that a sensor model can be created and correctly configured and that all related menus and buttons are functional

4.1.2.2 Procedure

Sensor Model Entry Test

Step	Procedure	Expected Result	P/F
1	OPEN EXISTING SENSOR MODEL Open the *Sensors…*Panel from the *Models* menu.	*Sensor Model Chooser* window appears.	
2	Click on the C*ertified* tab to display a list of sensors. Select one and *Open* it.	*Sensor Model Editor* window opens. Model name will be the name of the selected model.	
3	SAVE CERTIFIED SENSOR MODEL LEGALITY CHECK From the *File* menu, attempt to *Save* the Model after modifying.	The current data will be saved as a Working copy of the Certified model. No changes will be made to the Certified model.	
4	SAVE AS DEFAULT SENSOR MODEL Click on the arrow next to the *Mode Tag* field.	The arrow rotates downward and the sensor parameters are shown.	
5	Change the value of any *General* attribute.	Entry accepted	
6	Select the *Save as Default Model* option.	Action accepted As demonstrated below, when opening a future model of the same type (Tracking, Surveillance, IR, Telemetry, Optic, ESM, and GPS) and selecting the *Load Default Model* option, the values will be placed into the appropriate fields.	

Step	Procedure	Expected Result	P/F
7	Close *Sensor Model Editor* window.	Window will close.	
8	Open the *Sensor Model Chooser* window.	Action accepted.	
9	CREATE NEW SENSOR MODEL Create a new working model by typing **"ATPSen1"** into the *Name* field and then pressing the *New* button.	*Sensor Model Editor* window appears. Model name will contain the name as entered.	
10	Enter "**SEN1Mod**e" in the *Mode Name* field.	Entry accepted.	
11	Choose a sensor category of *Telemetry* from the *Type* pull down menu.	*Type* options menu pull down appears. *Telemetry* replaces *Tracking* in the *Type* Field upon selection	
12	EDIT SENSOR MODEL Edit the values of the *RF Loop Gain*, *Accuracy*, *Period*, and *General* attributes.	Entry accepted. Checking the RF Loop Gain box will cause many of the General attributes to become read-only and non-editable.	
13	VERIFY LEGALITIES Enter invalid data (*Minimum* values greater than the *Maximum*) that will cause faults in the *Detection Threshold* field.	Entry accepted.	
14	Save the model with the *Save* command.	Errors should occur of the form: Detection Threshold Field fails the validation condition: minimum value <= maximum value	
15	Change the value in the *Max Targets* field.	Entry accepted.	
16	Change the *Power*, *Beamwidth*, *Gain*, and *Frequency Band* fields.	Entry accepted.	
17	Enter a name in the *Mode Tag* field.		
18	Fix the Detection Threshold error.	Model is capable of being saved with no errors generated	

Step	Procedure	Expected Result	P/F
19	Create additional Op Modes by pressing *the Add Op Mode* button.	An additional heading of the format *Mode Tag: Untitled* will appear after all other present Op Modes.	
20	VERIFY UNITS DATA CONVERSION Verify by changing the units of measurement for various data fields by *Right Clicking* on the unit	Verify that when units are changed, conversions automatically take place. Verify that the conversions are accurate.	
21	VERIFY MODE INTEGRITY Edit attributes for two modes. Switch between modes.	No inputs from one mode should carry over to the other modes.	
22	SAVE MODEL Input valid data and Save the model from the *File* menu. Close window.	Model will be saved and seen under the Working tab of the *Sensor Model Chooser*.	
23	As before, open the *Sensor Model Chooser*.	Action accepted	
24	Select **ATPSen1** model and use the *Open* button to examine its attributes.	All previously saved data should be retained.	
25	VERIFY DATA DISCARDED WITH NO SAVE ACTION Again edit the attributes but exit without saving..	Action accepted.	
26	Reopen **ATPSen1** and verify that no data since last save is present.	Any changes made to the sensor after the last save will be discarded.	
27	DELETE WORKING SENSOR MODEL Close the window and reopen the *Sensor Model Chooser* window.	Action Accepted	
28	Select **ATPSen1** from the *Working* panel and hit *Delete.*	Model should disappear from the *Working* dialog box and the input field as well.	

Step	Procedure	Expected Result	P/F
29	VERIFY CERTIFIED MODELS PROTECTED Select a Model from the *Certified* panel and delete it.	Model should not be deleted and the delete button should remain grayed out and not selectable.	
30	COPY SENSOR MODEL Open an existing model. Change the *Model Name* to **ATPSen2** and *Save* from the *File* menu.	This allows for the ability to copy a sensor model to a file of a different name.	

4.1.3 Sensor Entity Creation Test

4.1.3.1 Objective

The purpose of this test is to verify that a sensor entity can be created and correctly configured and that all related menus and buttons are functional.

4.1.3.2 Procedure

Sensor Entity Creation Test

Step	Procedure	Expected Result	P/F
1	OPEN EXISTING SENSOR ENTITY Open the *Sensors…*Panel from the *Entities* menu.	*Sensor Entity Chooser* window appears.	
2	Click on the *Certified* tab to display a list of sensors. Select one and *Open* it.	*Sensor Entity Reader* window opens. Entity name will be the name of the selected model.	
3	SAVE CERTIFIED SENSOR ENTITY LEGALITY CHECK From the file menu, attempt to *Save* the Model after modifying.	The current data will be saved as a Working copy of the Certified entity. No changes will be made to the Certified entity.	
4	Close *Sensor Entity Editor* window.	Window will close.	
5	Open the *Sensor Entity Chooser* window.	Action accepted.	
6	CREATE NEW SENSOR ENTITY Create a new working model by typing "**ATPEntity1**" into the *Name* field and then pressing the *New* button.	*Sensor Entity Editor* window appears. Entity name will contain the name as inputted.	
7	Select a Model Name using the browse button. Use the Sensor Model **ATPSen2** created in the Sensor Model Entry Test.	The *Sensor Model Chooser* window will appear. The functionality of this window has been tested in the Sensor Model Entry Test. The selected model name should appear in the Model Name field.	

Step	Procedure	Expected Result	P/F
8	EDIT SENSOR ENTITY Set the Loc Type to Stationary. Provide positioning data.	All Sensor Entities not defined as part of a vehicle shall have a fixed position. The longitude, latitude and altitude all provided positioning data. N/S and E/W buttons should toggle (both can't be lit at the same time).	
9	Change entity data.	All attributes can be changed. If a shadow mask is present on the system, it can be added to the entity. The Mode field corresponds to the Op Modes of the Sensor Model.	
10	VERIFY UNITS DATA CONVERSION For altitude attribute, change unit type by *Right Clicking* the unit name.	When units are changed, conversions automatically take place. Verify that the conversions are accurate.	
11	Set the Loc Type to On Vehicle. Edit VID.	Assigns a VID to the sensor.	
12	SAVE ENTITY Input valid data and *Save* the entity from the *File* menu. Close window.	Model will be saved and seen under the Working tab of the *Sensor Entity Chooser*.	
13	As before, open the *Sensor Entity Chooser*.	Action accepted.	
14	Select **ATPEntity1** and use the *Open* button to examine its attributes.	All previously saved data should be retained.	
15	VERIFY DATA DISCARDED WITH NO SAVE ACTION Again edit the attributes but exit without saving.	Action accepted.	
16	Reopen **ATPEntity1** and verify that no data since last save is present.	Any changes made to the entity after the last save will be discarded.	
17	DELETE WORKING SENSOR ENTITY Close the window and reopen the *Sensor Entity Chooser* window.	Action accepted.	

Step	Procedure	Expected Result	P/F
18	Select ATPEntity1 from the *Working* panel and hit *Delete*.	Entity should disappear from the *Working* dialog box and the input field as well.	
19	VERIFY CERTIFIED ENTITIES PROTECTED Select an entity from the *Certified* panel and delete it.	Entity should not be deleted and the delete button should remain grayed out and not selectable.	
20	COPY SENSOR ENTITY Open an existing entity. Change the *Entity Name* to **ATPEntity2** and *Save* from the *File* menu.	This allows for the ability to copy a sensor model to a file of a different name.	

4.1.4 Data Set Creation Test

4.1.4.1 Objective

The purpose of this test is to demonstrate the capability to load and process TBM files in TAOS format.

4.1.4.2 Procedure

Data Set Creation Test

Step	Procedure	Expected Result	P/F
1	Open the *Create Data Set…* panel from the *Models* menu.	The *TAOS Interface* window appears.	
2	Choose a valid data set from the *Type* pulldown menu.	A valid data set will display file names in both the *Table Files* and *Problem Files* windows. Initial Launch Condition data is now present.	
3	Choose the table and problem files to create the model from their respective windows.	The file names will appear in the *Name* fields under the corresponding window. The Run option will now become selectable.	
4	Input a valid model name in the *Output* field.	An output file of the given name is placed in the tbm/*NAME* (where *NAME* is the taken from the *Type* field) directory off of the directory pointed to by the ESPRIT_TAOS_ROOT environment variable.	
5	Place data in the *Intial Launch Conditions, Aim Point Conditions,* and *Intercept Conditions* boxes.	These fields define model information. If nothing is changed, then default values are used.	
6	Press the *Run* button to place the TAOS model.	A TBM track will appear on the screen. For future scenarios, a TBM (same as that placed in the *Type* field will be selectable from the *Scenario Editior*).	
7	MODIFY EXISTING TBM Right click on the TBM track in the TACSIT. Select the *Modify Model* option.	A menu with location information (latitude, longitude, altitude), angle, and name field appears.	
8	Change the position data and angle.	This translates the origin and changes the rotation angle of the TBM.	
9	Input a name and save the modified TBM.	A new TBM type has been created with the saved data. It can now be accessed through the *Scenario Editor*.	

4.1.5 Data Set Conversion Test

4.1.5.1 Objective

The purpose of this test is to demonstrate the capability to load and process TBM files in ASCII format.

4.1.5.2 Procedure

Data Set Conversion Test

Step	Procedure	Expected Result	P/F
1	Open the *Convert Data Set…* panel from the *Models* menu.	The *Dataset Conversion* window appears.	
2	Choose whether the model is a TBM or an Interceptor.	This defines the model type. Valid file types will appear in the *Dataset files…*selection window.	
3	Choose a valid data set from the *Dataset files…*selection window.	The name of the dataset will be placed in the *Name:* edit box.	
4	Input a valid model name in the *Model Name* field.	Action accepted.	
5	Press the *Convert* button.	The ASCII representation of the TBM or Interceptor will be saved as valid working model.	

4.1.6 Overlay Generation Test

4.1.6.1 Objective

The purpose of this test is to verify that an overlay or set of overlays can be created and correctly configured and that all related menus and buttons are functional

4.1.6.2 Procedure

Overlay Generation Test

Step	Procedure	Expected Result	P/F
1	CREATE NEW OVERLAY Open the *Overlays…*Panel from the *Features* menu or press Ctrl+O.	*Overlay* window appears.	
2	Select the *Bearing/Range Grid* icon from the overlay icons at the top of the window. NOTE: This icon is third from the left.	Icon button will depress and Default Cursor icon will no longer be focused.	
3	Draw the overlay by left clicking once in the TACSIT window.	An overlay group with the name *Untitled x* (where x will indicate the number of other Untitled overlays already on the system) will appear with branch beneath it containing the overlay type drawn.	
4	Select the *Pointer Control* option from the Overlay window.	No further lines or points will be added to the overlay if the TACSIT is picked.	
5	EDIT OVERLAY Be sure the Bearing/Range Grid is selected from the TACSIT.	When selected, all points of the overlay that can be edited will be highlighted with a gold box. This will cause the overlay application to display the overlay attributes and permit the tester to modify the overlay.	
6	Alter Bearing/Range data. Press the *Apply* button.	Changes are made to the physical appearance of the grid.	
7	Select the *Color* tab and change the physical color of the overlay.	The overlay color changes.	

Step	Procedure	Expected Result	P/F
8	MOVE OVERLAY Left click and drag the overlay (clicking anywhere in the overlay boundary without selecting a point).	The position of the entire overlay will move maintaining shape and size.	
9	EDIT POINT Left click on a point. Change and *Apply* position data.	The point should become a solid box denoting a selected point. Precise location data is displayed and alterable in the overlay window. The position of the point should change, causing the overlay's shape to alter. The entire overlay will change location if the center point of the grid is selected.	
10	Left click and drag the selected point.	The point will change position and cause changes as described above.	
11	USE MENU FUNCTIONS TO ALTER OVERLAY Select the entire overlay. Use the *Draw* menu to rotate and flip the overlay.	The overlay should rotate right and left and be flipped vertically and horizontally depending on the option chosen.	
12	Click the rotate icon. Rotate the overlay by moving the focal point (dot in center) and then move corners of rotation box.	The overlay will rotate about the focal point. Clicking on the default pointer icon will resume normal control and place the rotated overlay.	
13	TEST FUNCTIONALITY OF EDIT MENU From the *Edit* menu, choose the *Cut* option.	Selected overlay will be deleted but can be replaced by selecting the Paste option from the Edit menu.	
14	From the *Edit* menu, choose the *Paste* option.	The cut overlay will be displayed on the screen and added as another branch to the overlay tree.	
15	From the *Edit* menu, choose the *Copy* option.	Creates a copy of the overlay that can be placed by selecting the *Paste* option from the *Edit* menu.	
16	From the *Edit* menu, choose the *Paste* option.	The copied overlay will be displayed on the screen and added as another branch to the overlay tree.	
17	From the *Edit* menu, choose the *Duplicate* option.	Creates a copy of the overlay without having to use the copy and paste method. No Untitled overlay set will be created.	
18	From the *Edit* menu, choose the *Delete* option.	Permanently deletes the overlay.	
19	From the *Edit* menu, choose the *New Group* option.	A new overlay group is created entitle Untitled x where x is the number of Untitled groups already in existence.	

Step	Procedure	Expected Result	P/F
20	From the *Edit* menu, choose the *Rename…* option. Rename the Untitled group. Press OK.	Changes the name of the Untitled group to an overlay group with the name the tester specified.	
21	From the *Edit* menu, choose the *Center On* option.	The TACSIT centers on the selected overlay.	
22	TEST FUNCTIONALITY OF FILE MENU Exit the overlay menu by selecting the *Close Panel* option from the *File* menu. Reply no to the save dialog.	All work will be erased and cleared from the TACSIT window.	
23	Reopen the overlay menu.	Action accepted.	
24	Create a new overlay.	All overlays are created as above. The only exceptions are the polygon and line overlays which require the operator to specify more than one initial point.	
25	With the overlay visible in the TACSIT and unhighlighted, click on the "Eye" icon in the overlay tree next to the overlay name.	This will cause the overlay to "Hide" and disappear from the screen.	
26	From the *File* menu select *Revert All*.	This will erase all unsaved overlay work.	
27	Create a new overlay and modify its attributes. From the *File* menu press *Save All*.	All work will be saved next time the overlay menu is opened.	
28	TEST FUNCTIONALITY OF GOG MENU Select the overlay. From the *GOG* menu, select *Write GOG File…*	Allows the overlay to be saved as a .gog file.	
29	Traverse directories as with any other application.	The saved file will be saved in the specified directory. *Look In* allows the path to be selected. *Up One Level* moves one step closer to the root directory. *Home Directory* defaults to the home directory.	

Step	Procedure	Expected Result	P/F
30	Save the GOG file by typing **ATPOverlay1** in the *File name* dialog box. Press SAVE.	A .gog file will be saved in the specified directory.	
31	Delete the overlay.	This will remove the overlay from the TACSIT.	
32	From the GOG menu select *Read GOG File…*	A list of GOG files in the current directory will appear in a new window.	
33	Select **ATPOverlay1** and press OPEN.	File containing the saved overlay will be opened and the overlay will appear in the TACSIT.	
34	EDIT COMPLEX OVERLAYS Create several overlays and group them into one complex overlay entity.	Action accepted.	
35	Edit the group functionality by selecting the group name from the tree structure.	Overlay groups can be defined as Debris Hazard areas, Planned Intercept Zones, and Keep Out Zones by specifying the group as a boundary. Overlays can be slaved to individual tracks.	
36	Create any new overlays to be used in future test and save using the *Save All* command from the *File* menu.	Action accepted.	

4.1.7 Create Scenario Test

4.1.7.1 Objective

The purpose of this test is to demonstrate the procedures for developing a simple scenario using the Sensor and Vehicles Models and Entities, and other visualization aids created earlier.

4.1.7.2 Procedure

Create Scenario Test

Step	Procedure	Expected Result	P/F
1	OPEN EXISTING SCENARIO Open the *Open…* Panel from the *Scenario* menu.	*Scenario Chooser* window appears.	
2	Click on the certified tab to display a list of scenarios. Select one and *Open* it.	*Scenario Editor* window opens. The window title will display the name of the selected scenario.	
3	SAVE CERTIFIED SCENARIO LEGALITY CHECK From the file menu, attempt to *Save Scenario*.	The current data will be saved as a Working copy of the Certified scenario. No changes will be made to the Certified scenario.	
4	Select the *Save as…*option from the *File* menu. Save as **ATPScen1**.	Allows the scenario to be modified and saved with a different name.	
5	Select the *Close Scenario* option from the *File* menu.	Window will close. If the scenario has been modified, a Save option window appears.	
6	DELETE WORKING SCENARIO Open the *Scenario Chooser* window.	Action accepted.	
7	Select the **ATPScen1** from the *Working* panel and hit *Delete.*	Scenario should disappear from the Working dialog box and the input field as well.	
8	VERIFY CERTIFIED SCENARIOS PROTECTED Select a scenario from the *Certified* panel and delete it.	Model should not be deleted and the delete button should remain grayed out and not selectable.	

Step	Procedure	Expected Result	P/F
9	CREATE NEW SCENARIO Create a new working scenario by typing a name into the name field and then pressing the new button.	*Scenario Editor* window appears. No tracks will appear on the TACSIT.	
10	PLACE VEHICLE IN SCENARIO Press an icon in the *Scenario Editor*.	A *Working* and *Certified* panel will appear with a list of valid model names.	
11	Locate **ATPVeh1** and select it. NOTE: Will be a working copy of the saved model type.	The name of the model will appear as Unnamed in the *Name* edit box.	
12	Change the name of the model.	Action accepted.	
13	Assign the Vehicle a unique ID.	The *Add to Scenario* button will become selectable. If an illegal ID is placed, once the *Add to Scenario* button is selected, the following error will occur: VID x already in use! Please enter a unique VID	
14	Press the *Add to Scenario* button.	Ability to place vehicle is in effect.	
15	Place a waypoint by clicking on the TACSIT.	Waypoint will be placed and *Information* panel will appear (if selected in the *Preferences* panel).	
16	Place several waypoints and press F2 or double left-click when finished.	A connective track will appear between each waypoint placed.	
17	PLACE SENSOR IN SCENARIO Select the *Sensor* icon from the *Scenario Editor*.	A list of sensors will appear.	
18	From the working tab select **ATPSen1**.	Values for sensor name and SID are placed in the appropriate fields.	
19	Press *Add to Scenario* button.	The Sensor will be added in its appropriate location.	
20	PLACE TBM IN SCENARIO Select the *TBM* icon from the *Scenario Editor*.	A list of TBM models will appear.	

Step	Procedure	Expected Result	P/F
21	From the working tab select the TBM created in the Data Set Creation or Data Set Conversion Test.	The TBM name will appear in the *Name* edit box.	
22	Assign the TBM a unique ID.	Same as placing a vehicle model.	
23	Press the Add to Scenario button.	TBM is placed in the scenario based on its model values.	
24	Save the scenario for future tests.	Scenario is saved.	

4.1.8 Final Scenario Preparation

4.1.8.1 Objective

The purpose of this test is to perform further functions to customize the scenario. These include placing special points, changing the information panels, and providing synchronization abilities.

4.1.8.2 Procedure

Final Scenario Preparation

Step	Procedure	Expected Result	P/F
1	Open a scenario.	Action accepted.	
2	ADD SPECIAL POINTS Select the *Special Points* option from the *Features* menu.	A window with a selectable menu will appear with the options of Default Pointer and Special Point Paint.	
3	Select the *Special Point Paint* option from the menu.	An arrangement of icons will be displayed.	
4	Select any one of the special points and place it on the TACSIT.	An icon matching the selected point type will be placed on the TACSIT.	
5	EDIT SPECIAL POINTS Open an *Information* Panel on the selected point.	A window with position data and a tag will appear.	
6	Change Tag data, position data, and test the mouse drag capability. Press *Apply*.	The tag will be displayed on the TACSIT next to the point. Changing the position physically moves the point. Enabling the mouse drag allows a left-click and drag combination to move the point.	
7	Close *Special Points* window.	Special points will continue to be placed until the window is closed.	
8	TEST SYNCHRONIZATION Be sure there are at least two vehicles present in the scenario.	In order to synchronize vehicle tracks, points must be selected from two different tracks.	
9	Hook a point from each vehicle (holding Shift while clicking allows multiple hooks)	Hooked points will be highlighted.	

Step	Procedure	Expected Result	P/F
	hooks).		
10	From the *Scenario* menu select the *Synchronize…* option.	The synchronization menu will appear.	
11	Select the *Synchronize* button.	The selected points will be connected with a synchronization line. Time tics (if present) may change to reflect the synchronization.	
12	Test the functionality of the other synchronization options.	*Un-synchronize* will remove the synch line. *Un-synchronize All Paths* will remove all synch lines from a scenario, while the *Reset All Vehicle Start Times* will cause all times to revert to their initial stages.	
13	TEST VEHICLE INFORMATION PANELS Hook a valid vehicle waypoint. Open the *Information…* window from the *Tracks* menu if needed.	Point is hooked causing the information menu to appear if it is set in the Preferences menu. The window has four selectable tabs including *Vehicle*, *Position*, *WP Ctrl*, and *TicControl*.	
14	Select the *Vehicle* tab.	A panel displaying pertinent vehicle information including the VID, Vehicle Name, Start Time, and Model.	
15	Change the information in the *Start Time* and *VID* field.	The initial vehicle start time and the VID will be set.	
16	Switch to the *Position* tab.	Current waypoint positioning data is displayed and can be altered.	
17	Edit data in the *Latitude*, *Longitude*, and *Altitude* fields. Apply the changes.	The waypoint and connecting track line will move accordingly.	
18	Press the *Undo Last Move* button.	Waypoint and connecting track line return to their original positions.	
19	Switch to the *WP Ctrl* tab.	Waypoint data is displayed, including Annotation, Speed, Rad. Curvature, Angle of Ascent and Climb Rate. Values should default to nominal model constraints.	
20	Edit data in the attribute fields. Apply changes.	Changing the Annotation field changes the label of the Waypoint. The other fields will allow the other attributes of the waypoint to be altered.	
21	Input bad data in the attribute fields. This data should exceed the max or be	Errors of the form: Waypoint Error! VID x, WPID y will occur. The value will revert to default value.	

Step	Procedure	Expected Result	P/F
	less than the min. values defined in the model.		
22	Press the *Delete* button.	The current waypoint is removed.	
23	Press the << or >>.	This allows a new waypoint to be dropped either in back (<<) or in front (>>) of the current point.	
24	Drop a waypoint by left clicking in the TACSIT.	A new waypoint will be placed in relation to the current waypoint and the track line moves accordingly.	
25	Switch to the *TicControl* tab.	Time tic data is displayed. This data will be valid for all tracks in the scenario.	
26	Change the Tic Interval and Tic Annotation Interval so that tics appear on the tracks.	Surface vehicle and ABT (manned) tracks do not get time tics.	
27	Press the *Make T0* button.	Time tics rezero on current waypoint.	
28	Press the *T0=0* button.	Time tics rezero to start time.	
29	TEST TIME TIC INFORMATION PANEL Hook time tic. Open an *Information* window.	An information window with three tabs labeled *Vehicle*, *TicControl*, and *TicInfo* appear. *Vehicle* and *TicControl* windows are identical to those in the waypoint windows. The *Make T0* button should be grayed out and unselectable. The *TicInfo* window has data on the tic point.	
30	Hook a waypoint. Switch to the *Vehicle* tab.	Action accepted.	
31	Press the *Delete Vehicle* button.	The vehicle track and all related waypoints are removed.	
32	TEST SENSOR INFORMATION PANEL Hook a sensor. Open an *Information* window.	An information window with two tabs labeled *Sensor Entity* and *Sensor Model* appear.	
33	On the *Sensor Entity* tab, assign a VID.	Legal values are any VID currently in the scenario. Other data displayed in the window include Model name, mode, SID, and position data.	
34	Click on the *Sensor Model* tab.	Attributes set in the Sensor Model are displayed.	

Step	Procedure	Expected Result	P/F
35	Delete the sensor from the *Sensor Entity* tab.	Sensor is removed from the scenario.	
36	Close the *Information* panel.	Action accepted.	
37	Analyze the signal/noise ratio data by right clicking a waypoint.	A graph depicting signal/noise ratio data appears.	
38	Save the scenario.	Action accepted.	

4.2 Phase 2 Test - Scenario Rehearsal

4.2.1 Objective

The purpose of this test is to demonstrate the ability to "pre-play" the scenario/test plan to ensure that it will correctly generate the vehicles with trajectories that follow the plan. For this test, This includes setting up various display options prior to event execution.

4.2.2 Procedure

Scenario Rehearsal and Playback Test

Step	Procedure	Expected Result	P/F
1.	INITIALIZE SCENARIO Click on the Scenario tab and select the scenario created in the previous tests.	Scenario plan (waypoints) is displayed.	
2.	From the *Scenario* menu select *Preview* Click on *Play (>)*	*Scenario Playback Control* panel is displayed. *Preview* is selected. Scenario begins. Verify that waypoints disappear and that the preview track symbols (green dots) appear.	
3.	INITIALIZE DX From the *Tracks* tab select *Playback Recorder*	*Trackrecorder* panel displayed.	
4.	Enter a scenario recording name at the *Record* tab. Click on *Record (o)* button	Name accepted. Recording light changes to red and recording name indicated in the Recoreding Status line at top of panel.	
5.	DISPLAY SENSOR IDENTIFICATION TABLE From the *Features* tab select *Sensor Identification Table*	*Sensor Identification Table* panel displayed with correct sensor data..	
6.	MULTIGRAPH SET-UP		

Step	Procedure	Expected Result	P/F
	From the *Features* menu select *Multigraph*.	*Multigraph* display panel initiated.	
7.	From the *X and Y Coordinate* tabs select attributes for *Rang*e and *Speed*. Hook a vehicle.	*Range* and S*peed* indicated as coordinate attributes in display panel. Verify that data for that vehicle is plotted in the Multigraph display.	
8.	Stop data recording and close the scenario noting the scenario time in the upper right hand corner of the *TACSIT*.	Verify recording ends and scenario closed.	
9.	VERIFY DATA RECORDING From the *Track* list select *Record/Playback*	*Trackrecorder* panel displayed and the just selected scenario name is displayed in the	
10.	From the Play: pull down menu select the ___*.dx* recorded data file created earlier in the test.	Correct .dx file displayed.	
11.	Click on the *Incremental Scenario Speed (>>)* button until 10.0X is displayed Click on the *Play* button (>)	Scenario is set to playback at 10 times realtime speed. Observe recorded scenario starts with Preview symbology (dots).	
12.	Click on *Stop* button	Scenario ends.	
13.	INITIALIZE SCENARIO Click on the Scenario tab and then select *Open* Select the CTV-1A scenario.	CTV-1A scenario plan displayed. TBM *Aspect Angle* panel is displayed.	
14.	From the *Tracks* menu select *Record/Playback* Click on *Play*	*Trackrecorder* panel displayed. Scenario begins	
15.	REQUEST VEHICLE REPORT **At the ESPRIT Server:** Place the system into the		

Step	Procedure	Expected Result	P/F
	ESPRIT Directory from which the planner is being run	Unix prompt displayed	
16.	**At the ESPRIT Client:** Click on the *Features* tab and select the *Request Vehicle Report*	*Request Vehicle Report* panel is displayed.	
17.	Click on the *Interva*l tab Enter a report file name with a *.rpt* file extension. Hook a vehicle and note its VID.	Interval data is displayed *.rpt* file name is displayed	
18.	Enter the VID number into the VID field in the *Request Vehicle Report* panel. Click on *Send Request*	Observe at the **ESPRIT Server** that the *.rpt* file appears in the ESPRIT root directory. (May have to refresh to get the updated list of files).	
19.	Continue to monitor the CTV-1A scenario as it unfolds using the status features defned in earlier tests.	CTV-1A scenario runs to completion with no errors.	

4.3 Phase 3 Test – Event Monitoring

4.3.1 Objective

The purpose of this test is to demonstrate (using recorded live CVT-1A data) the ESPRIT features that support TBM event monitoring.

4.3.2 Procedure

Event Monitoring Test

Step	Procedure	Expected Result	P/F
1.	INITIALIZE SCENARIO Click on the Scenario tab and then select *Open* Select the CTV-1A scenario.	 CTV-1A scenario plan displayed. TBM *Aspect Angle* panel is displayed.	
2.	Continue to monitor the CTV-1A scenario as it unfolds using the status features defned in earlier tests.	CTV-1A scenario runs to completion with no errors.	

4.4 Phase 4 Test – System Performance and Endurance

4.4.1 Objective

The purpose of this test is to demonstrate that "normal" ESPRIT planning activities can be performed in an environment comprising a minimum of 256 entities (combination of vehicles and sensors

4.4.2 Procedure

System Performance Test

Step	Procedure	Expected Result	P/F
1.	SCENARIO SET-UP Change the *TACSIT Range Scale* to 512miles From the *View* tab on the *TACSIT* menu bar, select *Locator*, click on *Charleston* and click on *Go To*	 TACSIT ranges out. East Coast of the United States is displayed.	
2.	From the *Scenario* menu *Open* and select *Coastal*	*Coastal* Plan is displayed.	
3.	From the *System* menu select *Status* and then click on the *Tracks* tab.	System *Status* panel is displayed and the *Tracks* and *Track History* graphics are presented with 0 tracks and 0 history points indicated.	
4.	INITIATE SCENARIO From the *Scenario* menu select *Preview* and then click on the *Preview* tab and select *Local Execution* from the pull down menu.	 *Scenario Playback Control* panel is displayed. *Local Execution* is selected.	
5.	Click on the *Incremental Scenario Speed (>>)* button until 8.0X is displayed. Click on *Play (>)*	Scenario is set to playback at 8 times actual speed. Scenario begins executing. Tracks and Track History point counters/graphic begin to show data.	
6.	From the *View* tab on the *TACSIT* menu bar, select *Locator*, click on *Hawaii* and click on *Go To*	 *TACSIT* shifts back to Hawaii.	

Step	Procedure	Expected Result	P/F
7.	MAX TRACKS VERIFICATION With more than 256 tracks in the system, begin entering special points, sensors, and vehicles.	Note: Verify number of system tracks remains high during data entry. Additional entities accepted on entry.	
8.	Create and enter an Overlay	Overlay entry and accepted and displayed.	
9.	Observe the scenario while performing routine tasks until the scenario completes.	Tasks performed acceptably.	
10.	After scenario completion, Close all windows and exit ESPRIT.	TACSIT cleaned up and successful Exit.	

4.4.3 Objective

The purpose of this test is to demonstrate a degree of system robustness in addition to being able to operate continuously for the duration of the CTV-1A event. Following a full day of testing, including the System Performance Test, the CTV-1A scenario plan is restarted with a delayed time-to-start equal to 0800 the following day. The system is left running overnight as the delay timer counts down and the scenario is played without errors

4.4.4 Procedure

System Endurance Test

Step	Procedure	Expected Result	P/F
1.	SCENARIO SET-UP Following the Performance Test, click on the *View* tab on the *TACSIT* menu bar, select *Locator*, click on *PMRF* and click on *Go To*	PMRF range area displayed.	
2.	From the *Scenario* menu *Open* and select *CTV-1A*	*CTV-1A* Plan is displayed.	
3.	From the *Scenario Preview* panel select *Local Execution*. Click on the Scenario *Start* button and then *Pause* the scenario. Enter a negative time in hours, minutes, and seconds that will begin the scenario at an agreed upon time the following morning and click on *Apply*. Click on the Scenario *Start* button.	The *Scenario Time To Start* field is populated with the appropriate time and the *Scenario Time Counter* in the upper portion of the TACSIT shows the correct time to start. The scenario begins and the T=HH:MM counter on the TACSIT begins to decrement.	
4.	DELAY The ROCS A and/or APIS room is secured. At the ageed upon time the following morning the test team reconvenes and confirms the system status	The scenario continues to count down overnight. The system is still running and the time to start counter is counting down to the scenrio start time.	
5.	Click on the *Incremental Scenario Speed (>>)* button until 8.0X is displayed	Scenario is set to playback at 8 times actual speed. Scenario begins executing.	
6.	After scenario completion, Close all windows and exit ESPRIT.	TACSIT cleaned up and successful Exit.	

Appendix A

Attached shall be the ESPRIT 1.0 Requirements Traceability Matrix (RTM) in a Microsoft Excel file.